SUMMARY OF POPULATION MONITORING OF RIO GRANDE SILVERY MINNOW

(21-27 February 2001)

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19 March 2001

Annotated field notes are based on provisional data that is subject to change

The first sampling foray for the 2001 Rio Grande silvery minnow population monitoring program was conducted between 21-27 February 2001. A total of 20 sites were designated as sampling locations for the 2001 collecting year. Five sites were located in the Angostura Reach, five sites in the Isleta Reach, and 10 sites in the San Acacia Reach. Five additional sites were added to the 2001 sampling program (as compared to 2000). There were no new sites in the Angostura Reach, three additional sites in the Isleta Reach, and two additional sites in the San Acacia Reach. The three new Isleta Reach sites were (from up to downstream): Los Lunas Bridge, the Transwestern Pipeline crossing at Jarales, and about 3.5 miles downstream of Bernardo. The two new San Acacia reach collection sites were 10 and 11 miles downstream of the San Marcial railroad crossing. A list of collection localities, including the new 2001 sites, is appended and listed as Table 1.

Fish were obtained by rapidly drawing a 3.1 m x 1.8 m small mesh (5 mm) seine through discrete mesohabitats. All Rio Grande silvery minnow were counted, identified to age-class, and released at the site of capture. All other fish from each seine haul were preserved in the field in 10% formalin and then returned to the Museum of Southwestern Biology - Division of Fishes for later processing and identification. Specimens are transferred from 10% formalin to water after several weeks and then, after several days, transferred to 50% alcohol prior to being sorted.

The first area sampled during this collection foray was just downstream of Angostura Diversion Dam [RM 209.7] and was made on 22 February 2001. Substrate consisted primarily of silt, sand, and cobble. Water temperature at this site was cold (7.0°C at 1320). The water level was moderately high and sampling was conducted primarily along the shoreline. Several pools and backwaters were sampled but produced no fish. The final of 18 seine hauls produced a single red shiner (*Cyprinella lutrensis*). It is not uncommon to encounter relatively few fish at this site during winter and early spring sampling efforts.

Our second collecting locality was at the NM State Highway 44 bridge crossing [RM 203.8] and was also sampled on 22 February 2001. Substrate consisted primarily of silt, sand, and cobble. The river was highly braided with a multitude of instream habitats. Water is extremely clear aand visibility is nearly 0.5 m. Only a few seine hauls produced fish (4 of 17). The fish collected came primarily from low velocity habitats along the shoreline or associated with instream debris. Red shiner was the most commonly collected taxa and most individuals were Age 1. A small (145 mm SL) brown trout (*Salmo trutta*) was taken at this site in a main channel run habitat.

The next site sampled on 22 February 2001 was just upstream of the Rio Rancho wastewater treatment plant [RM 200.0]. A moderate number of fish were collected throughout the site. The catch at the Rio Rancho site was similar to that at Bernalillo as it was comprised of primarily Age 1 red shiner and single specimens of flathead chub (*Platygobio gracilis*) and longnose dace (*Rhinichthys cataractae*). The channel was confined to a single moderately deep run throughout most of the site and habitats were fairly homogenous.

Sampling at the Central Avenue (US Highway 66) bridge crossing [RM 183.4] was completed on 23 February 2001. Substrate consisted primarily of sand and silt. Some gravel bars were present in the mid-channel areas. Most of the fish collected were in pools and found primarily along the shoreline. There was a fair amount of debris in the river at this locality but only a few fishes were collected from within these debris piles. Fish were present in most seine hauls (10 of 18) but no Rio Grande silvery minnow (*Hybognathus amarus*) were present. This species has been absent from this and upstream localities for quite some time. Red shiner again dominated the catch.

The Rio Bravo Boulevard bridge crossing [RM 178.3] was sampled on 23 February 2001. Water temperature was 12.0°C at 1420. A number of different pool/run habitats were present throughout the site. Only a few seining localities produced fish (3 of 19) and red shiner again dominated the catch. The lack of fish even in debris piles is somewhat surprising and could be related to a host of different factors including water quality.

The most upstream site in the Isleta Reach was the Los Lunas Bridge [RM 161.4] and was sampled on 27 February 2001. This is one of the three new (2001) Isleta Reach additions to the fish sampling regime. This site was monitored daily for flow during the 2000 USBR Middle Rio Grande Flow Monitoring program. The substrata consisted of silt and sand at this and the remaining downstream sites. Aquatic habitats at this site were primarily main channel runs, however there was a shallow backwater habitat downstream of the bridge that provided one of the few low-velocity habitats. That mesohabitat yielded the vast majority (>90%) of the catch at the Los Lunas site including over 1,000 red shiner, 1,200 river carpsucker, and 246 Rio Grande silvery minnow. The Rio Grande silvery minnow were counted, age determined, and released. This school of Rio Grande silvery minnow was comprised of about 42 Age 1 fish and 204 fish Age 2 or greater. Rio Grande silvery minnow was not taken in any of the additional seine hauls made at this site. Although an isolated occurence, this large collection of Rio Grande silvery minnow inidicates that this species is still persisting in the Isleta Reach. Other fish (red shiner, fathead minnow, flathead chub) were collected in the main channel run and pool habitats at this site but the number of individual per seine haul was always low (<10).

Catch at the Belen Site [RM 151.5] on 22 February 2001 was numerically dominated by red shiner. Additional species were flathead chub, fathead minnow, river carpsucker, and western mosquitofish. No Rio Grande silvery minnow were present at the Belen Site. Despite high flows, the river was quite braided throughout this section of the river.

Aquatic habitat at the Transwestern Pipeline Crossing (new site) [RM 143.2] was relatively homogenous and comprised of main channel runs and pools. This site was sampled on 27 February 2001. Most of the fish were taken in pools or in association with shallow habitats provided by sand islands. Red shiner was the most abundant fish taken. Flathead chub were collected in deep main channel runs. Several of the river carpsucker (*Carpiodes carpio*) collected were missing scales.

The U.S. Highway 380 Bridge site [RM 130.6] was sampled on 22 February 2001. The river channel at this locality was relatively wide and presented a wide variety of habitats to sample. Fish were captured in 15 of 17 seine hauls. As documented elsewhere, red shiner were the most abundant species collected. The largest number of individuals were taken in low velocity habitats. Water levels were high and the river was fairly turbid.

The new sampling locality 3.5 miles downstream of Bernardo [RM 127.0] was sampled on 27 February 2001 and was composed of relatively diverse habitats. At this site, the majority of fish were taken in shoreline habitats (=low-velocity). Red shiner was the most abundant fish present at this site, with western mosquitofish (*Gambusia affinis*) and fathead minnow (*Pimephales promelas*) being the second and third most common fish taxa present. Rio Grand silvery minnow were, with the exception of the Los Lunas Bridge sampling locality, not taken at any of the Isleta Reach sites.

Rio Grande silvery minnow were taken at nine of the 10 sampling localities in the San Acacia Reach during the February 2001 sampling foray. However, the number of individuals (Rio Grande silvery minnow) taken at these sites was very low compared to previous sampling efforts. The site immediately downstream of San Acacia Diversion Dam [RM 116.2] was the only one in

the San Acacia Reach that failed to produce Rio Grande silvery minnow. This site was sampled on 26 February 2001. Water levels were relatively high at this locality which precluded sampling of some deeper water habitats. The majority of fish collected at San Acacia Diversion Dam were taken in shoreline habitats with red shiner being the most common fish species.

Habitat at the site 1.5 miles downstream of San Acacia Diversion Dam [RM 114.6] was composed primarily of main channel runs. Sampling efforts were conducted at this site on 26 February 2001. Red shiner was the most abundant fish at this site with seven additional fish species being collected. A single Rio Grande silvery minnow (Age 1) was taken at this site in a main channel shoreline run habitat.

Sampling continued on 26 February 2001 at a site just upstream of the Socorro wastewater treatment plant [RM 99.5]. This site yielded over 1,700 red shiner and a total of eight Rio Grande silvery minnow (n= 7 Age 1; n=1 Age 2). There was a wide variety and quantity of aquatic habitats available and overall catch rates were higher than upstream sites. Rio Grande silvery minnow were taken in four separate seine hauls and all individuals were occupying side channel habitats.

The next downstream site (ca. 4 miles upstream of U.S. Highway 380 Bridge [RM 91.7]) was also sampled on 26 February 2001. Water was extremely turbid perhaps from recent rains. Fish were present in all but two of 17 seine hauls. Four Rio Grande silvery minnow were collected (including one Age 2 individual). These four fish were taken in four separate seine hauls in side channel habitats.

Sampling at the US Highway 380 bridge crossing near San Antonio, NM [RM 87.1] was conducted on 26 February 2001. The San Antonio Site sampling effort was quite similar to the three collections made upstream of that site. Red shiner comprised the vast majority of the collection with only a few Rio Grande silvery minnow taken (n=2). As was generally observed at the upstream San Acacia Reach sites, only one Rio Grande silvery minnow was taken at a time (i.e., in a seine haul). Four of the five sampling locations between San Acacia Diversion Dam and San Antonio yielded Rio Grande silvery minnow.

On 21 February 2001, we sampled the Rio Grande directly east of the Bosque del Apache National Wildlife Refuge [RM 79.1]. The river was confined to the east shoreline leaving the west bank exposed. A total of over 400 red shiner were collected at this site. Fish were primarily collected in areas of low-velocity and depositional substrata. Six Rio Grande silvery minnow were collected at this site (in three separate seine hauls). Four of the individuals were Age 1 while the other two were Age 2. Two of the individuals were quite small (22 mm SL and 23 mm SL) and somewhat below the normal size range (ca. 30-50 mm SL) for Age 1 Rio Grande silvery minnow in February. These individuals could have been the result of late summer spawning in 2000 or slow growth rates or both.

The San Marcial Railroad Bridge Crossing site [RM 68.6] was also sampled on 21 February 2001. The habitat available at this site was primarily main channel runs with limited shoreline habitats. This site yielded relatively few fish (compared to immediately upstream) but did produce two Rio Grande silvery minnow. A total of about 50 fish were collected at this site with red shiner accounting for 30 of those individuals. Both Rio Grande silvery minnow were Age 1 specimens.

The site at the former confluence of the Low Flow Conveyance Channel and Rio Grande [RM 60.5] yielded seven Rio Grande silvery minnow (n=5 Age 1; n=2 Age 2). This site was also sampled on 21 February 2001. Water temperatures at this (12.0°C at 1210) and other San Acacia Reach sites were not as cold as those recorded at upstream sites. River carpsucker was the most

abundant species at this site followed by red shiner. Most areas were inundated but flow was not bank-to-bank in all areas. Most fishes were collected along the shoreline.

The next downstream site (new site [RM 58.8]) was sampled on 21 February 2001. We sampled primarily along the east shoreline where some habitat heterogeneity persisted. Other areas were primarily deep runs and produced almost no fish. Fish were collected in 14 of 17 seine hauls and river carpsucker was the most abundant taxa collected. Only one Rio Grande silvery minnow (Age 1) was collected at this site.

The downstream most site (new site [RM 57.7]) was also sampled on 21 February 2001. River carpsucker was the most abundant fish species (n=30) followed by red shiner (n=29). A single Rio Grande silvery minnow was also taken at this locality (Age 1). The total number of Rio Grande silvery minnow taken at the five lowermost San Acacia Reach sampling localities was 17. While all five of the aforementioned sites yielded at least one Rio Grande silvery minnow, and nine of 10 San Acacia Reach site produced Rio Grande silvery minnow, their extreme rarity at these sites and in this reach is very disconcerting.

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Table 1. Collection localities for 2001 population monitoring of Rio Grande silvery minnow.

Site #	Site Locality
ANGOSTURA REACH SITES	
0	New Mexico, Sandoval County, Rio Grande, below Angostura Diversion Dam, Angostura. River Mile 209.7 SAN FELIPE PUEBLO QUADRANGLE 3916006 N 363811 E
1	New Mexico, Sandoval County, Rio Grande, at NM State Highway 44 bridge crossing, Bernalillo. River Mile 203.8 BERNALILLO QUADRANGLE 3909722 N 358543 E
2	New Mexico, Sandoval County, Rio Grande, ca. 4 miles downstream of NM State Highway 44 bridge crossing at Rio Rancho Wastewater Treatment Plant, Rio Rancho. River Mile 200.0 BERNALILLO QUADRANGLE 3905355 N 354772 E
3	New Mexico, Bernalillo County, Rio Grande, at Central Avenue (US Highway 66) bridge crossing, Albuquerque. River Mile 183.4 ALBUQUERQUE WEST QUADRANGLE 3884094 N 346840 E
4	New Mexico, Bernalillo County, Rio Grande, at Rio Bravo Boulevard bridge crossing, Albuquerque. River Mile 178.3 ALBUQUERQUE WEST QUADRANGLE 3877163 N 347554 E
ISLETA REACH SITES	
5	New Mexico, Valencia County, Rio Grande, at Los Lunas (NM State Highway 49) bridge crossing, Los Lunas. River Mile 161.4 LOS LUNAS QUADRANGLE 3852531 N 342898 E
6	New Mexico, Valencia County, Rio Grande, ca. 1.0 miles upstream of NM State Highway 309/6 bridge crossing, Belen. River Mile 151.5 TOME QUADRANGLE 3837061 N 339972 E
7	New Mexico, Valencia County, Rio Grande, ca. 2.2 miles upstream of NM State Highway 346 bridge crossing (near Transwestern Pipeline crossing), Jarales. River Mile 143.2 VEGUITA QUADRANGLE 3827329 N 338136 E

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Table 1 (continued.). Collection localities for 2001 population monitoring of Rio Grande silvery minnow.

Site #	Site Locality

ISLETA REACH SITES (continued)

8 New Mexico, Socorro County, Rio Grande, at US Highway 60 bridge crossing, Bernardo.
River Mile 130.6 ABEYTAS QUADRANGLE
3809726 N 334604 E

9 New Mexico, Socorro County, Rio Grande, ca. 3.5 miles downstream of US Highway 60 bridge crossing, La Joya.
River Mile 127.0 ABEYTAS QUADRANGLE
3805229 N 331094 E

SAN ACACIA REACH SITES

10 New Mexico, Socorro County, Rio Grande, directly below San Acacia Diversion Dam, San Acacia.
River Mile 116.2 SAN ACACIA QUADRANGLE
3791977 N 326162 E

11 New Mexico, Socorro County, Rio Grande, ca. 1.5 miles downstream of San Acacia Diversion Dam, San Acacia.
River Mile 114.6 LEMITAR QUADRANGLE
3790442 N 325263 E

12 New Mexico, Socorro County, Rio Grande, 0.5 miles upstream of the Low Flow Conveyance Channel bridge, east and upstream of Socorro Wastewater Treatment Plant, Socorro.
River Mile 99.5 LOMA DE LAS CANAS QUADRANGLE
3771043 N 327097 E

13 New Mexico, Socorro County, Rio Grande, ca. 4.0 miles upstream of US Highway 380 bridge crossing, San Antonio.
River Mile 91.7 SAN ANTONIO QUADRANGLE
3761283 N 328140 E

14 New Mexico, Socorro County, Rio Grande, at US Highway 380 bridge crossing, San Antonio.
River Mile 87.1 SAN ANTONIO QUADRANGLE
3754471 N 328914 E

15 New Mexico, Socorro County, Rio Grande, directly east of Bosque del Apache National Wildlife Refuge headquarters.
River Mile 79.1 SAN ANTONIO, SE QUADRANGLE
3740839 N 327055 E

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Table 1 (continued.). Collection localities for 2001 population monitoring of Rio Grande silvery minnow.

Site #	Site Locality
SAN ACACIA REACH SITES (continued)	
16	New Mexico, Socorro County, Rio Grande, at the San Marcial railroad crossing, San Marcial. River Mile 68.6 SAN MARCIAL QUADRANGLE 3728347 N 315284 E
17	New Mexico, Socorro County, Rio Grande, at its former confluence with the Low Flow Conveyance Channel and 16 miles downstream of the southern end of the Bosque del Apache National Wildlife Refuge. River Mile 60.5 PARAJE WELL QUADRANGLE 3718178 N 309487 E
18	New Mexico, Socorro County, Rio Grande, ca. 18 miles downstream of the southern end of the Bosque del Apache National Wildlife Refuge. River Mile 58.8 PARAJE WELL QUADRANGLE 3716150 N 307846 E
19	New Mexico, Socorro County, Rio Grande, ca. 19 miles downstream of the southern end of the Bosque del Apache National Wildlife Refuge. River Mile 57.7 PARAJE WELL QUADRANGLE 3714740 N 307380 E